

Appl. No. : 10/529,591
Filed : September 26, 2005

AMENDMENTS TO THE CLAIMS

1. (Currently amended) ~~A~~ Device for handling and recovering kinetic energy in a fluid, characterised in that it comprises comprising:

- a bladed reversible impeller (11); adapted to operate both as an autonomous centrifugal blower pushing the fluid under pressure to a fluid outlet and as a device to recover energy;
- a reversible engine/generator integral with the bladed impeller; and
- a fluid conveyor containing the impeller, which co-operates with the impeller to handle and recover the kinetic energy of incoming fluid, the fluid conveyor comprising a convergent spiral of a fluid inlet adapted to receive an incoming fluid and a divergent spiral of the fluid outlet; said bladed reversible wherein the impeller (11) having a common blades define continuous channels communicating at a first end with the fluid outlet and at a second opposite end with the fluid inlet, with said fluid conveyor (7), and the impeller being either moved supplied by a fluid supplied through said fluid inlet or conveyor (7), in such a way as it can slow down and convey mechanical power to the engine/generator (12), operating as an electric generator, or being accelerated by the reversible engine/generator (12), operating as an engine, in such a way as to be able to operate as a centrifugal blower delivering fluid under pressure through said fluid outlet. by means of the fluid conveyor (7).

~~— a reversible engine/generator (12) integral with the bladed impeller;~~

~~— a fluid conveyor (7) which co-operates with the impeller to handle and recover the kinetic energy of the incoming fluid.~~

2. Canceled.

3. (Currently amended) ~~Device as in~~ The device of claim 1 2, characterised in that wherein said fluid conveyor (7) includes also a duct (17) for recirculation or partial exhaust of excess fluid.

4. (Currently amended) ~~Device as in~~ The device of claim 1, characterised in that wherein said engine/generator (12) is integral with the bladed ~~flow~~ impeller (11) by means of a shaft.

5. (Currently amended) ~~Device as in~~ The device of claim 1, characterised in that wherein said engine/generator (12) is a high efficiency permanent magnet brushless electric three-phase synchronous machine which is supplied, as an engine, with alternate three-phase variable high

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frequency current, and outputs as a generator, an alternate three-phase current.

6. (Currently amended) ~~Device as in any of the previous claims, characterised in that~~ The device of claim 1, wherein the device is it is a single assembly body also comprising and further comprises:

- an engine/generator (11) casing (8) ~~equipped with~~ having a first cooler;
- a rear cover (9) integral with the ~~said~~ casing (8); and
- a front cover (10) ~~with relevant~~ having a second cooler, integral with the ~~said~~ fluid conveyor (7),

~~such~~ said single body containing ~~inside~~ the ~~said~~ engine/generator (12), and the bladed impeller (11) ~~and shaft (13).~~

7. (Currently amended) ~~Device as in~~ The device of claim 6, ~~characterised in that~~ wherein said engine/generator is integral with the bladed impeller by means of a shaft, and wherein said rotation shaft (13) is inserted in the said front and rear covers (9,10) by means of antifriction bearings (14).

8. (Currently amended) ~~Device as in any of the previous claims~~ The device of claim 1, in which said device is ~~characterised in that it is~~ made of aluminum alloy or stainless steel or titanium or ceramic material or composite materials such as fiber reinforced techno polymer.

9. (Currently amended) An ~~Overcharged~~ engine including a turbo supercharger, comprising ~~characterised in that it comprises~~ a device as in any of the previous claims, assembled in series between the said turbo supercharger and the ~~engine~~ pressurized fluid inlet.

10. (Currently amended) ~~Engine as in~~ The engine of claim 9, ~~characterised in that it is~~ for use on a road trailer ~~internal combustion engine.~~

11. (Currently amended) ~~Engine as in~~ The engine of claim 9, ~~characterised in that it is~~ for use on an airplane ~~aviation piston propulsor.~~

12. (Currently amended) ~~Engine as in~~ The engine of claim 9, ~~characterised in that it is~~ for use on a ship ~~an internal combustion engine for marine propulsion.~~

13. (Currently amended) ~~Engine as in~~ The engine of claim 9, ~~characterised in that~~ wherein it is a two-stroke-cycle internal combustion engine.